

Abstract of the disclosure

[0100] An interface that allows a user to model and analyze the properties of three dimensional surface and the regions surrounding such surfaces. The user manipulates a deformable bed of translucent glass beads that defines the geometry of a surface. An array of light emitting diodes underneath the beads transmits infrared light upwardly through the beads such that the intensity of radiation from each position on the surface of the beads is related to the depth of the beads at that position. A digital camera captures radiation image data which is then processed to create elevation data specifying the geometry of the surface. A processor processes the elevation data using a selected analysis function to produce result data representing computed characteristics of the surface or its surrounding region. The result data is projected as an image onto the surface of the beads. The interface permits the user to modify a surface geometry and directly visualize the characteristics of the modified geometry in real time.